In the Claims:

Claims 1-115 (cancelled)

116. (new) A system for producing an ultrasound image, comprising:

a single element ultrasonic transducer for generating ultrasound at a frequency of at least 20 megahertz (20MHz), for transmitting at least a portion of the generated ultrasound into a subject and for receiving ultrasound energy from the subject;

a means for oscillating the transducer along a reciprocating arcuate path at a frequency of at least 7.5 Hz; and

a processor for processing the received ultrasound to provide an image having a frame rate of at least 15 frames per second (fps).

117. (new) The system of Claim 116, wherein the transducer is configured for oscillation about a pivot axis, and wherein the pivot axis is spaced a predetermined distance from the transducer for movement of the transducer along the reciprocating arcuate path.

118. (new) The system of Claim 116, wherein the transducer is located within an enclosed volume for its oscillation along the reciprocating arcuate path, and wherein the enclosed volume is at least partially filled with a fluid.

119. (new) The system of Claim 118, wherein the enclosed volume is partially defined by an acoustically penetrable membrane and wherein the acoustically penetrable membrane is positioned such that at least a portion of the generated ultrasound passes therethrough the membrane before being transmitted into the subject.

120. (new) The system of Claim 119, wherein the acoustically penetrable membrane is sealably attached to a frame member, wherein the frame member and the membrane comprise the same material, and wherein the frame member is configured for releasable attachment to a nosepiece of a ultrasound scanhead.

121. (new) The system of Claim 120, wherein the material is polyethylene.

122. (new) The system of Claim 121, wherein the polyethylene is low density polyethylene (LDPE).

123. (new) The system of Claim 119, wherein at least a portion of the transducer can contact at least a portion of the interior surface of the membrane during its oscillation along the reciprocating arcuate path.

124. (new) The system of Claim 116, wherein the transducer can be oscillated along the reciprocating arcuate path over a distance of less than or equal to 15 millimeters (mm).

125. (new) The system of Claim 116, wherein the transducer can be oscillated along the reciprocating arcuate path over a distance of less than or equal to 10 millimeters (mm).

126. (new) The system of Claim 116, wherein the transducer can be oscillated along the reciprocating arcuate path over a distance of less than or equal to 22 degrees.

127. (new) The system of Claim 116, wherein the transducer can be oscillated along the reciprocating arcuate path at a frequency of at least 15Hz and wherein the processor is configured to provide an image having a frame rate of at least 30 fps.

128. (new) The system of Claim 116, wherein the transducer can be oscillated along the reciprocating arcuate path at a frequency of at least 30 Hz and wherein the processor is configured to provide an image having a frame rate of at least 60 fps.

129. (new) The system of Claim 116, further comprising a position encoder for determining the position of the transducer along its reciprocating arcuate path.

130. (new) The system of Claim 129, wherein the position encoder is configured such that the position of the transducer can be accurately tracked along the reciprocating arcuate path to within about 1.0 micron (μm) of the actual transducer position.

131. (new) The system of Claim 116, wherein the processor is further configured to produce an ultrasound image having a spatial resolution of less than about 100 microns (μm).

132. (new) The system of Claim 116, wherein the processor is further configured to produce an ultrasound image having a spatial resolution of about and between 75-100 microns (μm).

133. (new) The system of Claim 116, wherein the processor is further configured to produce an ultrasound image having a spatial resolution of about and between 30-100 microns (μm).

134. (new) The system of Claim 116, wherein the transducer can be oscillated along the reciprocating arcuate path at a frequency of at least 15Hz and wherein the processor is configured to provide an image having a frame rate of at least 30 fps and a spatial resolution of less than about 100 microns (μm).

135. (new) The system of Claim 116, wherein the transducer can be oscillated along the reciprocating arcuate path at a frequency of at least 30 Hz and wherein the processor is configured to provide an image having a frame rate of at least 60 fps and a spatial resolution of less than about 100 microns (μm).

136. (new) The system of Claim 116, further comprising a means for positioning the transducer to within about 1 micron (μm) of a predetermined location along the reciprocating arcuate path.

137. (new) The system of Claim 136, wherein the processor is further configured to provide a pulsed-wave Doppler image.

138. (new) The system of Claim 136, wherein the processor is further configured to provide an

M-Mode image.

139. (new) The system of Claim 116, wherein the means for oscillating the transducer comprises a limited angle motor.

140. (new) The system of Claim 139, wherein the limited angle motor is a moving coil type torque motor.

141. (new) The system of Claim 139, wherein the limited angle motor can oscillate the transducer along the reciprocating arcuate path at a speed of at least about 10Hz.

142. (new) The system of Claim 139, wherein the limited angle motor can oscillate the transducer along the reciprocating arcuate path at a speed of at least about 15Hz.

143. (new) The system of Claim 139, wherein the limited angle motor can oscillate the transducer along the reciprocating arcuate path at a speed of at least about 30Hz.

144. (new) The system of Claim 118, wherein the transducer and the means for moving the transducer are located in a scanhead and the scanhead further comprises a pivot frame and a rotor assembly pivotally mounted to the pivot frame, wherein the rotor assembly comprises a pivoting member having a distal end.

145. (new) The system of Claim 144, wherein the transducer is mounted to the distal end of the pivoting member and wherein at least a portion of the pivoting member and the transducer are positioned therein the fluid filled enclosed volume.

146. (new) The system of Claim 145, further comprising a sealing membrane, wherein the sealing membrane contacts at least a portion of the pivoting member and contacts at least a portion of the pivot frame to define the enclosed volume and wherein the sealing membrane defines at least a portion of the enclosed volume.

147. (new) The system of Claim 146, wherein the sealing membrane contacts the pivoting member at the pivot axis of the pivoting member.

148. (new) The system of Claim 146, wherein the sealing membrane is configured to reduce stretch deformation of the sealing membrane when the pivoting member is oscillated within the enclosed volume.

149. (new) The system of Claim 148, wherein the sealable membrane comprises a flexible elastomer.

150. (new) The system of Claim 120, further comprising a shroud member sealably attachable to the frame member, and whereby ultrasound transmitted from the transducer and into the subject does not pass through the shroud member.

151. (new) The system of Claim 150, wherein the shroud member covers at least a portion of the scanhead.

152. (new) The system of Claim 151, wherein the shroud member covers substantially all of the scanhead.

153. (new) The system of Claim 150, wherein the shroud member is sterile.

154. (new) The system of Claim 116, wherein the transducer is configured to generate ultrasound at a frequency of between about 25MHz and about 60MHz.

155. (new) The system of Claim 116, wherein the transducer is configured to generate ultrasound at a frequency of at least about 25MHz.

156. (new) A system for producing an ultrasound image, comprising:

a pivoting member configured for rotation about a pivot axis;

a single element ultrasonic transducer for generating ultrasound at a frequency of at least 20 megahertz (20MHz), for transmitting at least a portion of the generated ultrasound into a subject and for receiving ultrasound energy from the subject, wherein the transducer is mounted to a distal end of the pivoting member;

a means for oscillating the transducer above the pivot axis for movement of the transducer along a reciprocating arcuate path at a frequency of at least 7.5 Hz; and

a processor for processing the received ultrasound to provide an image having a frame rate of at least 15 frames per second (fps).

157. (new) A system for producing an ultrasound image, comprising:

a rotor assembly having a pivoting member, a distal end of the pivoting member being configured for connection to a transducer assembly, the transducer assembly comprising a single element ultrasonic transducer that is configured for generating ultrasound at a frequency of at least 20 megahertz (20MHz) for transmiting at least a portion of the generated ultrasound into a subject and for receiving ultrasound energy from the subject;

a means for oscillating the rotor assembly such that the distal end of the pivoting member can be oscillated along a reciprocating arcuate path at a frequency of at least 7.5 Hz; and

a processor configured for processing received ultrasound to provide an image having a frame rate of at least 15 frames per second (fps).

158. (new) A scanhead comprising:

a transducer assembly comprising a single element transducer for generating ultrasound at a frequency of at least about 20MHz, the transducer having a distal face;

a pivot frame having a distal end;

a rotor assembly comprising a pivoting member having a distal end, the transducer assembly being mounted to the distal end of the pivoting member;

a means for mounting the rotor assembly to the pivot frame;

a means for oscillating the rotor assembly in an operating plane to move the transducer along a reciprocating arcuate path at a frequency of at least 7.5 Hz;

a nosepiece comprising a proximal end, a distal end that defines a window opening, and an acoustic window that is mounted in the window opening to seal the distal end of the nosepiece, the nosepiece further defining an interior cavity, and the proximal end of the nosepiece being attachable to the distal end of the pivot frame to define an enclosed volume, wherein at least a portion of the pivoting member and the transducer are positioned therein the enclosed volume and wherein the enclosed volume is at least partially filled with a fluid.

159. (new) The scanhead of Claim 158, wherein the transducer is positioned for oscillation above a pivot axis, and wherein the pivot axis is spaced a predetermined distance from the transducer for movement of the transducer along the reciprocating arcuate path.

160. (new) The scanhead of Claim 158, wherein the acoustic window has an elongate dimension extending along a window axis, and wherein, in use, the window axis of the acoustic window is positioned in the operating plane.

161. (new) The scanhead of Claim 160, wherein the window axis has an arcuate cross-sectional shape, such that when the rotor assembly oscillates, the transducer pivots in proximity to at least a portion of the inner surface of the acoustic window.

162. (new) The scanhead of Claim 160, wherein the distal face of the transducer is spaced from the interior surface of the acoustic window from about at least 0.5 millimeters (mm).

163. (new) The scanhead of Claim 160, wherein at least a portion of the transducer can contact at least a portion of the interior surface of the acoustic window during its oscillation along the reciprocating arcuate path.

164. (new) The scanhead of Claim 158, wherein the pivot frame has a pivot axis about which the rotor assembly pivots, wherein the pivot frame has an operating axis that bisects the window axis of the acoustic window and the pivot axis of the pivot frame, and wherein the means for

oscillating the rotor assembly moves the transducer through an acute angle with respect to the operating axis.

165. (new) The scanhead of Claim 164, wherein the means for oscillating the rotor assembly moves the transducer above and below the operating axis within the operating plane.

166. (new) The scanhead of Claim 158, wherein the transducer can be oscillated along the reciprocating arcuate path over a distance of less than or equal to 15 millimeters (mm).

167. (new) The scanhead of Claim 158, wherein the transducer can be oscillated along the reciprocating arcuate path over a distance of less than or equal to 10 millimeters (mm).

168. (new) The scanhead of Claim 167, wherein the acute angle of the operating axis is less than or equal to about 22°.

169. (new) The scanhead of Claim 158, further comprising a sealing membrane, wherein the sealing membrane contacts at least a portion of the pivoting member and contacts at least a portion of the pivot frame to define the enclosed volume, and wherein the sealing membrane defines at least a portion of the enclosed volume.

170. (new) The scanhead of Claim 169, wherein the sealing membrane contacts the pivoting member at the pivot axis of the pivoting member.

171. (new) The scanhead of Claim 169, wherein the sealing membrane configured for reducing stretch deformation of the sealing membrane when the pivoting member is oscillated within the enclosed volume.

172. (new) The scanhead of Claim 171, wherein the sealable membrane comprises a flexible elastomer.

173. (new) The scanhead of Claim 158, wherein the fluid has an impedance substantially similar to the impedance of tissue.

174. (new) The scanhead of Claim 158, wherein the fluid is a glycol.

175. (new) The scanhead of Claim 158, wherein the fluid is water.

176. (new) The scanhead of Claims 158 or 173, wherein the fluid is selected from the group consisting of: water, ethylene glycol, triethylene glycol, and light paraffin oil.

177. (new) The scanhead of Claim 158, wherein the acoustic window has an acoustic impedance that is substantially the same as the acoustic impedance of the fluid.

178. (new) The scanhead of Claim 158, wherein the acoustic window has an impedance of between about 1.0 megaRayles and 3.3 megaRayles.

179. (new) The scanhead of Claim 158, wherein the acoustic window has an impedance of between about 1.5 megaRayles and 1.8 megaRayles.

180. (new) The scanhead of Claim 158, wherein the acoustic window comprises a material selected from the group consisting of: polyester, polycarbonate, acrylic, thermoplastic elastomer, silicone elastomer, laytex elastomer, Surlyn® ionomer, Surlyn® 8940, Kapton®, polymethyl pentene, TPX® MX-002, TPX® 95, MX-004; Teflon®, Mylar®, polyethylene, polytetrafluoroethylene, polycarbonate, polypropylene, and polyurethane films.

181. (new) The scanhead of Claim 180, wherein the polyethylene comprises low density polyethylene.

182. (new) The scanhead of Claim 158, wherein at least a portion of the acoustic window is positioned in the scanhead such that ultrasound generated by the transducer can contact and

penetrate the acoustic window.

183. (new) The scanhead of Claim 158, wherein the acoustic window comprises a frame portion and a membrane portion, wherein the frame portion and the membrane portion comprise the same material, and wherein the membrane portion is positioned therein the frame portion.

184. (new) The scanhead of Claim 183, wherein the material is polyethylene.

185. (new) The scanhead of Claim 184, wherein the polyethylene is low density polyethylene (LDPE).

186. (new) The scanhead of Claim 158, wherein the acoustic window has a thickness of about 0.9 microns (μm) to about 60.0 microns (μm).

187. (new) The scanhead of Claim 158, wherein the transducer is a broadband transducer.

188. (new) The scanhead of Claim 158, wherein the transducer is configured to generate ultrasound at a frequency of between about 25MHz and about 60MHz.

189. (new) The scanhead of Claim 158, wherein the transducer is configured to generate ultrasound at a frequency of at least about 25MHz.

190. (new) The scanhead of Claim 158, wherein the means for oscillating the rotor assembly can move the transducer along the reciprocating arcuate path at a frequency of at least about 15Hz.

191. (new) The scanhead of Claim 158, wherein the means for oscillating the rotor assembly can move the transducer along the reciprocating arcuate path at a frequency of at least about 30Hz.

192. (new) The scanhead of Claim 158, wherein the means for moving the transducer comprises a limited angle motor.

193. (new) The scanhead of Claim 192, wherein the limited angle motor is a moving coil type torque motor.

194. (new) The scanhead of Claim 192, wherein the limited angle motor is configured to move the transducer along the reciprocating arcuate path at a speed of at least about 15Hz.

195. (new) The scanhead of Claim 192, wherein the limited angle motor is configured to move the transducer along the reciprocating arcuate path at a speed of at least about 30Hz.

196. (new) The scanhead of Claim 158, wherein the rotor assembly further comprises a position encoder for determining the position of the transducer along its predetermined path.

197. (new) The scanhead of Claim 196, wherein the positing encoder is configured to determine the position of the transducer to within about 1.0 micron (μm).

198. (new) The scanhead of Claim 158, further comprising a means for positioning the transducer to within about 1 micron (μm) of a predetermined location along the reciprocating arcuate path.

199. (new) The scanhead of Claim 183, further comprising a shroud member, wherein the shroud member is sealably attachable to the frame member of the acoustic window such that ultrasound transmitted from the transducer and into the subject does not pass through the shroud member.

200. (new) The scanhead of Claim 199, wherein the shroud member covers at least a portion of the scanhead.

201. (new) The scanhead of Claim 200, wherein the shroud member covers substantially all of the scanhead.

202. (new) The scanhead of Claim 199, wherein the shroud member is steralizable.

203. (new) The scanhead of Claim 202, wherein the shroud member is sterile.

204. (new) A method for producing an ultrasound image, comprising:

generating ultrasound at a frequency of at least about 20 megahertz (20MHz) using a single element ultrasonic transducer, transmitting at least a portion of the generated ultrasound into a subject, and receiving ultrasound energy from the subject;

oscillating the transducer along a reciprocating arcuate path at a frequency of at least 7.5 Hz during the generation, transmission and receipt of the ultrasound; and

processing the received ultrasound to provide an image having a frame rate of at least 15 frames per second (fps).

205. (new) The method of Claim 204, wherein the transducer is oscillated above a pivot axis, and wherein the pivot axis is spaced a predetermined distance from the transducer for movement of the transducer along the reciprocating arcuate path.

206. (new) The method of Claim 204, wherein the transducer is located within an enclosed volume for its oscillation along the reciprocating arcuate path, and wherein the enclosed volume is at least partially filed with a fluid.

207. (new) The method of Claim 206, wherein the enclosed volume is partially defined by a membrane and wherein at least a portion of the transmitted ultrasound penetrates the membrane before being transmitted into the subject.

208. (new) The method of Claim 207, wherein at least a portion of the transducer contacts at least a portion of the interior surface of the membrane during its oscillation along the

reciprocating arcuate path.

209. (new) The method of Claim 207, wherein the ultrasound is transmitted into the subject from a location external to the subject.

210. (new) The method of Claim 204, wherein the subject is a small animal.

211. (new) The method of Claim 210, wherein the small animal is a mouse.

212. (new) The method of Claim 210, wherein the small animal is a rat.

213. (new) The method of Claim 204, wherein the subject is an embryo.

214. (new) The method of Claim 204, further comprising using ultrasound in a frequency range of 20 MHz to 60MHz.

215. (new) The method of Claim 204, further comprising using the ultrasound image to guide a needle.

216. (new) The method of Claim 213, further comprising imaging an organ within the small animal.

217. (new) The method of Claim 216, further comprising imaging an organ chosen from a lung, a heart, a brain, a kidney, a liver and blood.

218. (new) The method of Claim 216, further comprising imaging a neo-plastic condition.

219. (new) The method of Claim 204, wherein the transducer is oscillated along the reciprocating arcuate path over a distance of less than or equal to 15 millimeters (mm).

220. (new) The method of Claim 204, wherein the transducer is oscillated along the reciprocating arcuate path over a distance of less than or equal to 10 millimeters (mm).

221. (new) The method of Claim 204, wherein the transducer is oscillated along the reciprocating arcuate path over a distance of less than or equal to 22 degrees.

222. (new) The method of Claim 204, wherein the transducer is oscillated along the reciprocating arcuate path at a frequency of at least 15Hz, and wherein the provided image has a frame rate of at least 30 fps.

223. (new) The method of Claim 204, wherein the transducer is oscillated along the reciprocating arcuate path at a frequency of at least 30 Hz, and wherein the provided image has a frame rate of at least 60 fps.

224. (new) The method of Claim 204, wherein the position of the transducer is accurately tracked along the reciprocating arcuate path to within about 1.0 micron (μm) of the actual transducer position using a position encoder.

225. (new) The method of Claim 204, further comprising positioning the transducer to within about 1 micron (μm) of a predetermined location along the reciprocating arcuate path.

226. (new) The method of Claim 225, wherein the provided image is a pulsed-wave Doppler image.

227. (new) The method of Claim 225, wherein the provided image an M-Mode image.

228. (new) The method of Claim 204, wherein the ultrasound image produced has a spatial resolution of less than 100 microns (μm).

229. (new) The method of Claim 204, wherein the ultrasound image produced has a spatial

resolution of about and between 75-100 microns (μm).

230. (new) The method of Claim 204, wherein the ultrasound image produced has a spatial resolution of about and between 30-100 microns (μm).

231. (new) The method of Claim 204, wherein the transducer is oscillated along the reciprocating arcuate path at a frequency of at least 15Hz, and wherein the image produced has a frame rate of at least 30 fps and a spatial resolution of less than about 100 microns (μm).

232. (new) The method of Claim 204, wherein the transducer is oscillated along the reciprocating arcuate path at a frequency of at least 30 Hz, and wherein the image produced has a frame rate of at least 60 fps and a spatial resolution of less than about 100 microns (μm).